

What is claimed is:

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1. A tire pressure monitoring device for monitoring tire pressure, said monitoring device comprising:

a housing coupled to a tire valve;

said housing having a first pressure chamber, a second pressure chamber, and a flexible membrane, wherein said first and second pressure chambers are separated by a flexible membrane; and

a signaling means located within said housing, wherein said signaling means emits a warning signal when a pressure within the first pressure chamber is greater than a pressure within the second pressure chamber.

2. The tire pressure monitoring device of claim 1 wherein said housing further comprises:

a lens, a main housing, and a lower housing, wherein said lens is coupled to a first end of said main housing and said lower housing is coupled to a second end of said housing.

3. The tire pressure monitoring device of claim 2 further comprising a screw cap that couples said lens to said main housing.

4. The tire pressure monitoring device of claim 3 further including a conductive gasket provided between said lens and said main body.

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5. The tire pressure monitoring device of claim 1 wherein said housing further includes at least one battery.

6. The tire pressure monitoring device of claim 1 wherein said flexible membrane is a conductive substance.

7. The tire pressure monitoring device of claim 6 wherein said conductive

substance is a conductive metal or conductive rubber.

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8. The tire pressure monitoring device of claim 1 wherein said signaling means is coupled to a printed circuit board.

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9. The tire pressure monitoring device of claim 1 wherein said signaling means is selected from the group consisting of a light emitting diode (LED), a speaker, a radio frequency (RF) transmitter, and a infrared (IR) transmitter.

10. A tire pressure monitoring device for monitoring tire pressure, said tire pressure monitoring device comprising:

a lens, a main housing body, and a lower housing body, wherein

said lens is coupled a first end of said main housing, and said lower housing is coupled to said lower housing body;

said lens at least partially defining a counter-pressure chamber;

said main housing body defining a main pressure chamber having a power supply, a signaling means, and a flexible membrane;

said flexible membrane separating said counter-pressure chamber and said main pressure chamber; and

said lower housing body adapted to engage a tire valve.

11. The tire pressure monitoring device of claim 10 further comprising a screw cap that couples said lens to said main housing.

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12. The tire pressure monitoring device of claim 10 further including a conductive Seal provided between said lens and said main body.

13. The tire pressure monitoring device of claim 10 wherein said power supply is at least one battery.

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14. The tire pressure monitoring device of claim 10 wherein said signaling means is selected from the group consisting of a light emitting diode (LED), a speaker, a radio frequency (RF) transmitter, and a infrared (IR) transmitter.

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15. The tire pressure monitoring device of claim 10 wherein said flexible membrane is a conductive substance.

16. The tire pressure monitoring device of claim 15 wherein said conductive substance is a conductive metal or a conductive rubber.

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17. A tire pressure monitoring device for monitoring tire pressure, said tire pressure monitoring device comprising:

a housing, wherein said housing is adapted to engage a tire valve; and

said housing including a means for sensing a pressure differential and a means for signaling said pressure differential.

18. A method of monitoring air pressure within a tire, said method comprising:

providing a tire pressure monitoring device of claim 1;

attaching said tire pressure monitoring device to a tire valve;

calibrating said tire pressure monitoring device;

monitoring a pressure differential between said tire pressure monitoring device and an air pressure of said tire; and

emitting a warning signal when said pressure differential exceeds a predetermined pressure differential.

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19. The method of claim 18 wherein said calibrating step further includes allowing air from said tire to enter a counter-pressure chamber of said tire pressure monitoring device and sealing said counter-pressure chamber.

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20. The method of claim ¹⁵19 wherein said pressure differential is a difference between the pressure of said counter-pressure chamber and said air pressure of said tire.

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21. The method of claim 20 wherein said warning signal may be a signal selected from the group consisting of a light, a sound, a radio frequency (RF) wave, and an infrared (IR) light.

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22. The method of claim ¹⁴18 further comprising:

removing said tire pressure monitoring device to periodically to ensure that said device is properly working.

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23. The method of claim ¹⁴18 further comprising:

removing said tire pressure monitoring device from said tire valve;

adding air pressure to said tire; and

reattaching said tire pressure monitoring device to said tire valve.

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24. A valve cap having an interior air pressure supplied through a conventional tire valve, said valve cap comprising:

a transparent top,

a light emitting diode (LED) attached to a printed circuit board;

an upper housing which accommodates the LED and the printed circuit board;

a flexible membrane;

a counter-pressure chamber, wherein the counter-pressure chamber is a space between the transparent top and the membrane;

at least one battery located within the upper housing; and

a lower housing which is internally threaded and adapted to mate with a tire valve

as
end
assembly.

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25. A valve cap as defined in claim ²²24, wherein the circuit board further
comprises flashing circuitry.

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